

CLAIMS

What is claimed is:

1. An electrostatic chuck comprising:
 - a) a chuck body having a chucking surface;
 - 5 b) a film electrode embedded in the chuck body; and
 - c) a dielectric layer having an essentially uniform thickness between the film electrode and the chucking surface.
2. The electrostatic chuck of Claim 1 wherein thickness of the dielectric layer has a variation expressed as a range which is smaller than about 700 microns.
- 10 3. The electrostatic chuck of Claim 1 wherein thickness of the dielectric layer has a variation expressed as a standard deviation which is less than about 160 microns.
4. The electrostatic chuck of Claim 1 wherein the dielectric layer has a thickness ranging from about 50 microns to about 5000 microns.
5. The electrostatic chuck of Claim 1 wherein the chuck body includes aluminum
15 nitride.
6. The electrostatic chuck of Claim 1 wherein the film electrode includes a metal selected from the group consisting of molybdenum, tungsten and any combination thereof.
7. The electrostatic chuck of Claim 1 wherein the film electrode has a thickness
20 ranging from about 50 microns to about 250 microns.

8. The electrostatic chuck of Claim 1 wherein the film electrode is a screen printed electrode.
9. A method of producing an electrostatic chuck comprising the steps of:
 - a) screen printing a film electrode onto a surface of a sintered substrate;
 - 5 b) forming a green ceramic layer onto and overlaying the film electrode; and
 - c) sintering the green ceramic layer under pressure, thereby forming the electrostatic chuck.
10. The method of Claim 9 wherein the sintered substrate includes aluminum nitride.
11. The method of Claim 9 wherein the green ceramic layer includes aluminum nitride.
12. The method of Claim 1 wherein the film electrode includes a first metal selected from the group consisting of molybdenum, tungsten and any combination thereof.
- 15 13. The method of Claim 12 wherein the film electrode further includes a second metal selected from the group consisting of nickel, cobalt and any combination thereof.
14. The method of Claim 13 wherein the second metal is essentially dissolved in the first metal.
- 20 15. The method of Claim 9 wherein screen printing includes silk screening glass-free conductive pastes.

16. The method of Claim 9 wherein agglomerates are removed prior to forming the green ceramic layer.
17. The method of Claim 9 wherein the green ceramic layer is evenly distributed onto the film electrode.
- 5 18. The method of Claim 9 wherein hot pressing is in an inert atmosphere.
19. The method of Claim 9 further including heat treating in an atmosphere consisting essentially of argon.
20. An electrostatic chuck produced by a method comprising the steps of:
 - a) screen printing a film electrode onto a surface of a sintered substrate;
 - 10 b) forming a green ceramic layer onto and overlaying the film electrode; and
 - c) sintering the green ceramic layer under pressure, thereby forming the electrostatic chuck.
21. A method of producing an electrostatic chuck comprising the steps of:
 - 15 a) depositing a film electrode by a process selected from the group consisting of chemical vapor deposition and physical vapor deposition onto a surface of a sintered substrate;
 - b) forming a green ceramic layer onto and overlaying the film electrode; and
 - 20 c) sintering the green ceramic layer under pressure, thereby forming the electrostatic chuck.
22. An electrostatic chuck produced by the method of Claim 21.

23. A method of producing an electrostatic chuck comprising the steps of:
- (a) screen printing a film electrode onto a surface of a sintered substrate, wherein the film electrode includes a first metal and a second metal, all the second metal being essentially dissolved in the first metal;
 - 5 (b) forming a green ceramic layer onto and overlaying the film electrode; and
 - (c) sintering the green ceramic layer under pressure, thereby forming the electrostatic chuck.